UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/714,871	11/17/2000	Richard Hellberg	2466-76	4896

7590 12/17/2004

Nixon & Vanderhye PC
1100 North Glebe Road 8th Floor
Arlington, VA 22201-4714

EXAMINER	
ZHENG, EVA Y	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/714,871	HELLBERG ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

2. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 4 recites the limitation " the step of mixing and amplifying". There is insufficient antecedent basis for this limitation in the claim.

6. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 9 recites the limitation " wherein side-bands". There is insufficient antecedent basis for this limitation in the claim.

8. Claims 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Regarding claim 11, line 19-20 is contradicting to line 1-10 since the filtering step is generated after the AC carrier signal generating step. Therefore, the AC carrier signals and band-pass filters are confusing.

b) Regarding claim 11 recites the limitation "wherein when two band-pass filters". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

10. Claims 1-4, 6-16 and 18 are rejected under 35 U.S.C. 102(a) as being anticipated by Hellberg et al (WO 98/11683).

a) Regarding claim 1, Hellberg et al. disclose a method of generating on an output line a high-power modulated radio frequency signal from a low or medium frequency information signal, comprising:

pulse-shaping the information signal (XIF) using sampling having a sampling frequency to form a digital signal having at least two discrete signal values; (Page 12, L3-5)

generating for each of the discrete signal values a corresponding alternating current (AC) carrier signal; (sequence B of Fig. 5; Page 12, L1 5-18)

using each discrete signal value to control connecting the corresponding AC carrier signal to the output line to produce a switched radio frequency signal carrying the information signal (Abstract); and

filtering (block 430) the switched radio frequency signal for obtaining the high-power modulated radio frequency signal;

wherein in connecting the AC carrier signals, the times at which the connecting of any of the AC carrier signals is started of ended are chosen to coincide with a moment at which the respective AC carrier signal is equal to zero or is close to zero to avoid energy losses during the starting or ending of the connecting. (Page 13, L3-10).

b) Regarding claim 2, Hellberg et al. disclose the method according to claim 1, wherein in the step of generating, the AC carrier signals are generated to have frequencies being multiples of the sampling frequency of digital signal (Page 12, L 16-18).

c) Regarding claim 3, Hellberg et al. disclose a method of generating on an output line a high-power modulated radio frequency signal from a low or medium frequency information signal, comprising:

pulse-shaping the information signal (XIF) using sampling having a sampling frequency to form a digital signal having at least two discrete signal values; (Page 12, L3-5)

generating for each of the discrete signal values a corresponding alternating current (AC) carrier signal; (sequence B of Fig. 5; Page 12, L1 5-18)

using each discrete signal value to control connecting the corresponding AC carrier signal to the output line to produce a switched radio frequency signal carrying the information signal (Abstract); and

filtering (block 430) the switched radio frequency signal for obtaining the high-power modulated radio frequency signal;

wherein in the step of generating, the AC carrier signals are generated to be sinusoidal signals (Page 11, L14-16).

d) Regarding claim 4, Hellberg et al. disclose the method according to claim 3, wherein in the step of filtering, a band-pass filtering is made rejecting distortion and/or an unwanted side band produced by the controlled connecting of the carries in the step of mixing and amplifying (Page 12, L 25-29).

e) Regarding claim 6, Hellberg et al. disclose a method of generating on an output line a high-power modulated radio frequency signal from a low or medium frequency information signal, comprising:

pulse-shaping the information signal (XIF) using sampling having a sampling frequency to form a digital signal having at least two discrete signal values; (Page 12, L3-5)

generating for each of the discrete signal values a corresponding alternating current (AC) carrier signal; (sequence B of Fig. 5; Page 12, L1 5-18)

using each discrete signal value to control connecting the corresponding AC carrier signal to the output line to produce a switched radio frequency signal carrying the information signal (Abstract); and

filtering (block 430) the switched radio frequency signal for obtaining the high-power modulated radio frequency signal;

wherein in the step of generating, the AC carrier signals are generated as non-sinusoidal signals (Page 13, L 3-10) to be sums of frequency components, all of the components having frequencies being integer multiples of the sampling frequency (Page 12, L 16-18).

f) Regarding claim 7, Hellberg et al. disclose the method according to claim 6, wherein in the step of generating, the AC carrier signals are generated to stay close to zero for a time period or around the times at which the connecting of any of the AC carrier signals is started or ended (Page 13, L3-10).

g) Regarding claim 8, Hellberg et al. disclose the method according to claim 1, wherein the information signal is quadrature shifted in two components so that, in the step of pulse-shaping, two digital signals are formed, each having at least two discrete signal values (Yi and YQ in Fig. 14), and that in the step of generating, AC carrier signals are generated for each of the signal values of the two digital signals, the AC carrier signals generated for the signal values of one of the digital signals having a 90 degrees phase-difference (14050 in Fig. 14) in relation to the AC carriers generated for the signal values of another of the two digital signals (14030 and 14040 in Fig. 14).

h) Regarding claim 9, Hellberg et al. disclose the method according to claim 8, wherein side-bands of the switched radio frequency signal are used as two linearly independent channels as in thee quadrature phase I and Q arrangement (as shwon in Fig. 14).

i) Regarding claim 10, Hellberg et al. disclose the method according to claim 8, wherein when one band-pass filter (430 in Fig. 4) is used, the signals are added before the filter (as shown in Fig. 4)

j) Regarding claim 11, Hellberg et al. disclose a method of generating on an output line a high-power modulated radio frequency signal from a low or medium frequency information signal, comprising:

pulse-shaping the information signal (XIF) using sampling having a sampling frequency to form a digital signal having at least two discrete signal values; (Page 12, L3-5)

generating for each of the discrete signal values a corresponding alternating current (AC) carrier signal; (sequence B of Fig. 5; Page 12, L1 5-18)

using each discrete signal value to control connecting the corresponding AC carrier signal to the output line to produce a switched radio frequency signal carrying the information signal (Abstract) ; and

filtering (block 430) the switched radio frequency signal for obtaining the high-power modulated radio frequency signal;

wherein the information signal is quadrature shifted in two components so that, in the step of pulse-shaping, two digital signals are formed, each having at least two

discrete signal values (Yi and YQ in Fig. 14), and that in the step of generating, AC carrier signals are generated for each of the signal values of the two digital signals, the AC carrier signals generated for the signal values of one of the digital signals having a 90 degrees phase-difference (14050 in Fig. 14) in relation to the AC carriers generated for the signal values of another of the two digital signals (14030 and 14040 in Fig. 14), and

wherein when two band-pass filters are used for filtering, the AC carrier signals are added after the band-pass filters (Page 12, L 3-9).

k) Regarding claim 12, Hellberg et al. disclose a method according to claim 8, wherein the filter(s) is/are (a) band-pass filter (s) rejecting distortion achieved by the amplificiation (Page 12, L 22-29).

l) Regarding claim 13, Hellberg et al. disclose the method according to claim 1, wherein the step of pulse-shaping, a digital signal having only two signal values is formed (Page 12, L11-13).

m) Regarding claim 14, Hellberg et al. disclose apparatus for generating a high-power modulated radio frequency signal from a low or medium frequency information signal, comprising:

a quantifier (inherent as $\Sigma\Delta$ modulator 410 in Fig. 4) for pulse-shaping, according to a sampling frequency, the information signal to form a digital signal having at least two discrete signal values (Page 12, L3-5);

a switching unit (423 in Fig. 4) connected to the quantifier to receive the digital signal and including multiple alternating current (AC) carrier signal generators (512 and

511 in Fig. 5), one individual AC carrier signal generator provided for and associated with each of the at least two signal values (as shown in Fig. 5); and

a filter (430 in Fig. 4) connected to an output lime of the switching unit for providing the high-power modulated radio frequency signal,

wherein each of the switches (423 in Fig. 5) is associated with and controlled by one of the digital signal values (422 in Fig. 5) to connected the AC carrier signal generator (511 in Fig. 5) associated with the signal value to the output line when the digital signal adopts the respective signal value and to disconnect the AC carrier signal generator when the digital signal does not adopt the respective signal value (as shown in Fig. 5).

n) Regarding claim 15, Hellberg et al. disclose the apparatus according to claim 14, wherein the quantifier comprise a sigma-delta modulator (410 in Fig. 4).

o) Regarding claim 16, Hellberg et al. disclose the apparatus, wherein the filter is a band-pass filter for rejecting unwanted and distortion achieved by controlled connecting and disconnecting of the AC signal generators (Page 12, L 25-29).

p) Regarding claim 18, Hellberg et al. disclose wherein the quantifier is configured to generate the digital signal values to connect or disconnect the AC carrier signals at times when the AC carrier signals have a magnitude at or near zero (Page 13, L3-10).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hellberg et al (WO 98/11683).

Regarding claim 17, Hellberg disclose all the subject matter described above except for the specific teaching of an AC signal carrier generator includes a transformer.

It is well known in electrical engineering that mutually inductive coils (known as transformers) charge with magnetic filed energy and create alternating signals (AC). Therefore, it is obvious to one of ordinary skill in the art to include transformers in Hellberg's AC carrier generator to provide different signal amplitudes. In doing so, provide better and desirable signal modulation over a wide range of frequencies.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Yi Zheng whose telephone number is (571) 272-3049. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-879-9306.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Eva Yi Zheng
Examiner
Art Unit 2634

November 29, 2004

SHUWANG LIU
PRIMARY EXAMINER